Amendment Under 37 C.F.R. § 1.111 U.S. Appln. No. 09/676,095

Attorney Docket No.: Q56074

AMENDMENTS TO THE DRAWINGS

The attached sheets of drawings include the following changes:

As requested by the Examiner, Figures 1, 3, and 5-7 have been amended to change the term, "GARBOR" to "GABOR".

Attachment: Five (5) Replacement Sheets for Figures 1-7

Five (5) Annotated Sheets Showing Changes for Figures 1-7

Inventors' Names: Hyun-doo SHIN, et al. Title: METHOD FOR ANALYZING TEXTURE Q DIGITAL IMAGE

Appln. No.: 09/676,095 Filed: 10/02/2000

Sughrue Ref. No.: Q56074

Sughrue Telephone No.: (202) 293-7060 Replacement Sheet for Figure(s) 1&2



FIG. 1 (PRIOR ART)

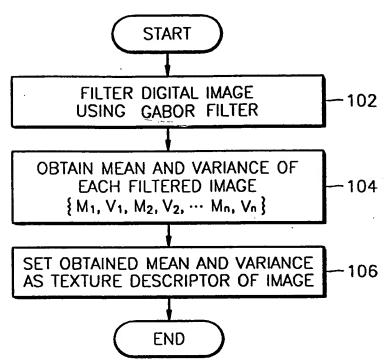
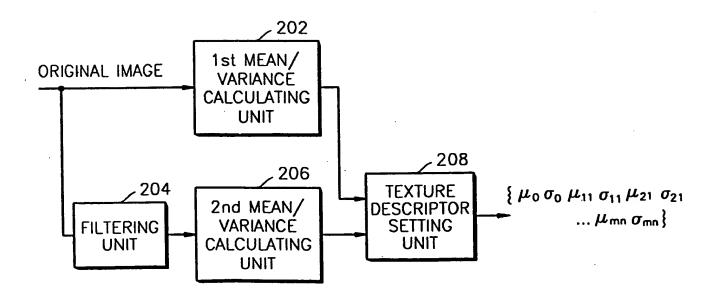


FIG. 2



inventors Names. Hyun-doo SHIN, et al. Title: METHOD FOR ANALYZING TEXTL DIGITAL IMAGE

Appln. No.: 09/676,095 Filed: 10/02/2000

Sughrue Ref. No.: Q56074

Sughrue Telephone No.: (202) 293-7060 Replacement Sheet for Figure(s) 3&4

FIG. 3

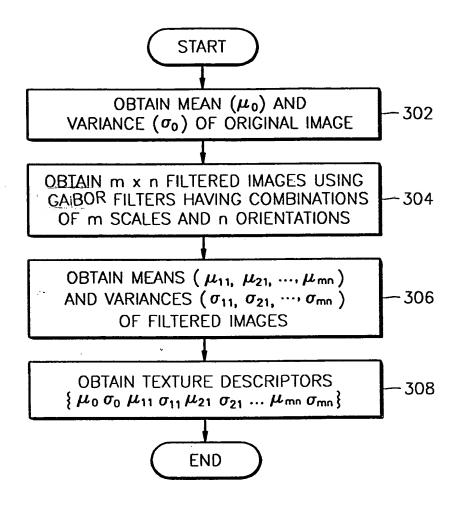
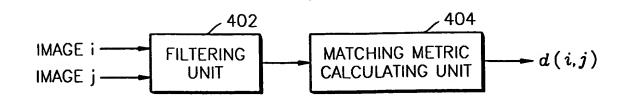


FIG. 4



Inventors' Names: Hyun-doo SHIN, et al.
Title: METHOD FOR ANALYZING TEXTUR

DIGITAL IMAGE Appln. No.: 09/676,095 Filed: 10/02/2000

Sughrue Ref. No.: Q56074

Sughrue Telephone No.: (202) 293-7060

Replacement Sheet for Figure(s) 5

FIG. 5



OBTAIN m x n FILTERED IMAGES USING GABOR FILTERS HAVING COMBINATIONS OF m SCALES AND n ORIENTATIONS WITH RESPECT TO TWO ARBITRARY IMAGES, ASSUMING THAT m AND n ARE PREDETERMINED POSITIVE INTEGERS

502

CALCULATE MATCHING METRIC DEFINED BY EQUATION,

 $d\left(i,j\right) = \Sigma_{\text{m,n}} \ d_{\text{m,n}}(i,j) + b$, with Respect to Original images and m x n filtered images, assuming that means and variances of Pixel values of Original images and the Respective images are denoted by μ and σ , and μ_0 and σ_0 , Respectively,

$$b = \left| \frac{\mu_0(i) - \mu_0(i)}{\alpha(\mu_0)} \right| + \left| \frac{\sigma_0(i) - \sigma_0(i)}{\alpha(\sigma_0)} \right|.$$

$$d_{\mathsf{m,n}}(i,j) = \left| \frac{\mu_{\mathsf{m,n}}^{(i)} - \mu_{\mathsf{m,n}}^{(j)}}{\alpha(\mu_{\mathsf{m,n}})} \right| + \left| \frac{\sigma_{\mathsf{m,n}}^{(i)} - \sigma_{\mathsf{m,n}}^{(j)}}{\alpha(\sigma_{\mathsf{m,n}})} \right|$$

-504

END

Inventors' Names: Hyun-doo SHIN, et al.

Title: METHOD FOR ANALYZING TEXTURE
DIGITAL IMAGE

Appln. No.: 09/676,095 Filed: 10/02/2000

Sughrue Ref. No.: Q56074

Sughrue Telephone No.: (202) 293-7060

Replacement Sheet for Figure(s) 6

FIG. 6



OBTAIN m x n FILTERED IMAGES USING GABOR FILTERS HAVING COMBINATIONS OF m SCALES AND n ORIENTATIONS WITH RESPECT TO TWO ARBITRARY IMAGES, ASSUMING THAT m AND n ARE PREDETERMINED POSITIVE INTEGERS

CALCULATE MATCHING METRIC DEFINED BY EQUATION,

$$d_{m,n}(i,j) = \min_{1 \le t \le K} \left[\sum_{m,n} \left(\left| \frac{\mu_{m,n}^{(i)}}{\alpha(\mu_{m,n})} - \frac{\mu_{m,n}^{(j)} \oplus t}{\alpha(\mu_{m,n})} \right| \right] \right]$$

$$+ \left| \frac{\sigma_{m,n}^{(i)}}{\alpha(\sigma_{m,n})} - \frac{\sigma_{m,n}^{(j)} \oplus t}{\alpha(\sigma_{m,n})} \right| \right) + b,$$

WITH RESPECT TO m x n FILTERED IMAGES, ASSUMING THAT MEAN AND VARIANCE OF PIXEL VALUES OF THE RESPECTIVE IMAGES ARE DENOTED BY μ AND σ , RESPECTIVELY, MEAN AND VARIANCE OF PIXEL VALUES OF ORIGINAL IMAGES ARE DENOTED BY μ_0 AND σ_0 RESPECTIVELY, K IS A PREDETERMINED POSITIVE INTEGER REPRESENTING THE NUMBER OF ORIENTATION COEFFICIENTS TO BE CONSIDERED,

$$b = \left| \frac{\mu_0^{(i)} - \mu_0^{(j)}}{\alpha(\mu_0)} \right| + \left| \frac{\sigma_0^{(i)} - \sigma_0^{(j)}}{\alpha(\sigma_0)} \right| + \text{AND} \quad \oplus$$

DENOTES A MODULO-SHIFT FUNCTION

END

-602

-604

Inventors' Names: Hyun-doo SHIN, et al.
Title: METHOD FOR ANALYZING TEXT
DIGITAL IMAGE

Appln. No.: 09/676,095 Filed: 10/02/2000

Sughrue Ref. No.: Q56074

Sughrue Telephone No.: (202) 293-7060
Replacement Sheet for Figure(s) 7

FIG. 7

START

OBTAIN m x n FILTERED IMAGES USING GABOR FILTERS HAVING COMBINATIONS OF m SCALES AND n ORIENTATIONS WITH RESPECT TO TWO ARBITRARY IMAGES, ASSUMING THAT m AND n ARE PREDETERMINED POSITIVE INTEGERS

-702

- 704

CALCULATE MATCHING METRIC DEFINED BY EQUATION,

$$d_{m,n}(i,j) = \min_{\substack{p=0,1\\q=0,1}} \left[\sum_{m=1}^{S-1} \sum_{m} \left(\left| \frac{\mu_{m+p,n}^{i}}{\alpha(\mu_{m+p,n})} - \frac{\mu_{m+q,n}^{j}}{\alpha(\mu_{m+q,n})} \right| \right]$$

$$+\left|\frac{\sigma_{\mathsf{m+p,n}}^{i}}{\alpha(\sigma_{\mathsf{m+p,n}})}-\frac{\sigma_{\mathsf{m+q,n}}^{j}}{\alpha(\sigma_{\mathsf{m+q,n}})}\right|\right)\right]+b$$

WITH RESPECT TO m x n FILTERED IMAGES, ASSUMING THAT MEAN AND VARIANCE OF PIXEL VALUES OF THE RESPECTIVE IMAGES ARE DENOTED BY μ AND σ , RESPECTIVELY, MEAN AND VARIANCE OF PIXEL VALUES OF ORIGINAL IMAGES ARE DENOTED BY μ_0 AND σ_0 RESPECTIVELY, AND

$$b = \left| \frac{\mu_0(i) - \mu_0(i)}{\alpha(\mu_0)} \right| + \left| \frac{\sigma_0(i) - \sigma_0(i)}{\alpha(\sigma_0)} \right|$$

END